

Unit 3 Day 3 HW(2)

1. A record is spinning at the rate of 25 rpm (revolutions per minute). If a ladybug is sitting 10 cm from the center of the record:

- a) What is the angular velocity of the ladybug? (in radians/sec)

- b) What is the linear speed of the ladybug? (in cm/sec)

- c) After 20 seconds, how far has the ladybug traveled? (in cm)

- d) After 20 seconds, what angle has the ladybug turned through? (in radians)

2. An ant sits on a cd at a distance of 17 cm from the center. If it sits there for 42 seconds, it travels a total distance of 913 cm.

- a) What angle has the ant turned through? (in radians)

- b) What linear speed has the ant been traveling at? (in cm/sec)

- c) What angular velocity has the ant been spinning at? (in radians/sec)

Angles and Radian Measure Applications

1. Find the distance s covered by a point moving with linear velocity $v = 55$ mi/hr and $t = 0.5$ hr.

2. A bicycle traveled a distance of 100 meters. The diameter of the wheel of this bicycle is 40 cm. Find the number of rotations of the wheel.

3. The wheel of a car made 100 rotations. What distance has the car traveled if the diameter of the wheel is 60 cm?

4. The wheel of a machine rotates at the rate of 300 rpm (rotation per minute). If the diameter of the wheel is 80 cm, what are the angular (in radian per second) and linear speeds (in cm per second) of a point on the wheel?

5. The Earth rotates about its axis once every 24 hours (approximately). The radius R of the equator is approximately 4000 miles. Find the angular (radians / second) and linear (feet / second) speeds of a point on the equator.

6. The diameter of the Ferris wheel is 250 ft , the distance from the ground to the bottom of the wheel is 14 ft , and one complete revolution takes 20 minutes, find
 - a. The linear velocity, in miles per hour, of a person riding on the wheel.

 - b. The height of the rider in terms of the time t , where t is measured in minutes.

7. A ball on the end of a string is spinning around a circle with a radius of 5 cm. If in 5 seconds a central angle of $1/18$ radians has been covered, what is the angular speed of the ball? What is the linear speed of the ball?

8. A lawnmower blade of 1.5 feet rotates 55 rpm has a linear velocity of what?

9. A 78 rpm Bing Crosby record has a radius of 6 inches. What is the linear velocity?